# Comparison of results from new build(Mar/12) versus pro build with golden dimuon samples

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# outline

- Comparison of results from new build(Mar/12) versus pro build with golden dimuon samples
  - Show mass plots depending on cuts for both arms
  - Show various variable distribution depending on lib. and cuts
- Zero supp. study with golden dimuon samples
  - For two different cases
  - [zero suppression SAHPE mode on and off]
  - Compare occupancy and mass plots applying different cuts

# Comparison of results from new build(Mar/12) versus pro build with golden dimuon samples

- Used samples : south=446, north=67 (unlike sign pairs in mass range 2.8~3.4 from pro.52 version)
- BBCLL1~ 70M, lvl2 dimuon ~ 3M

- Used cut : mentioned here as a cut A

=>SOUTH

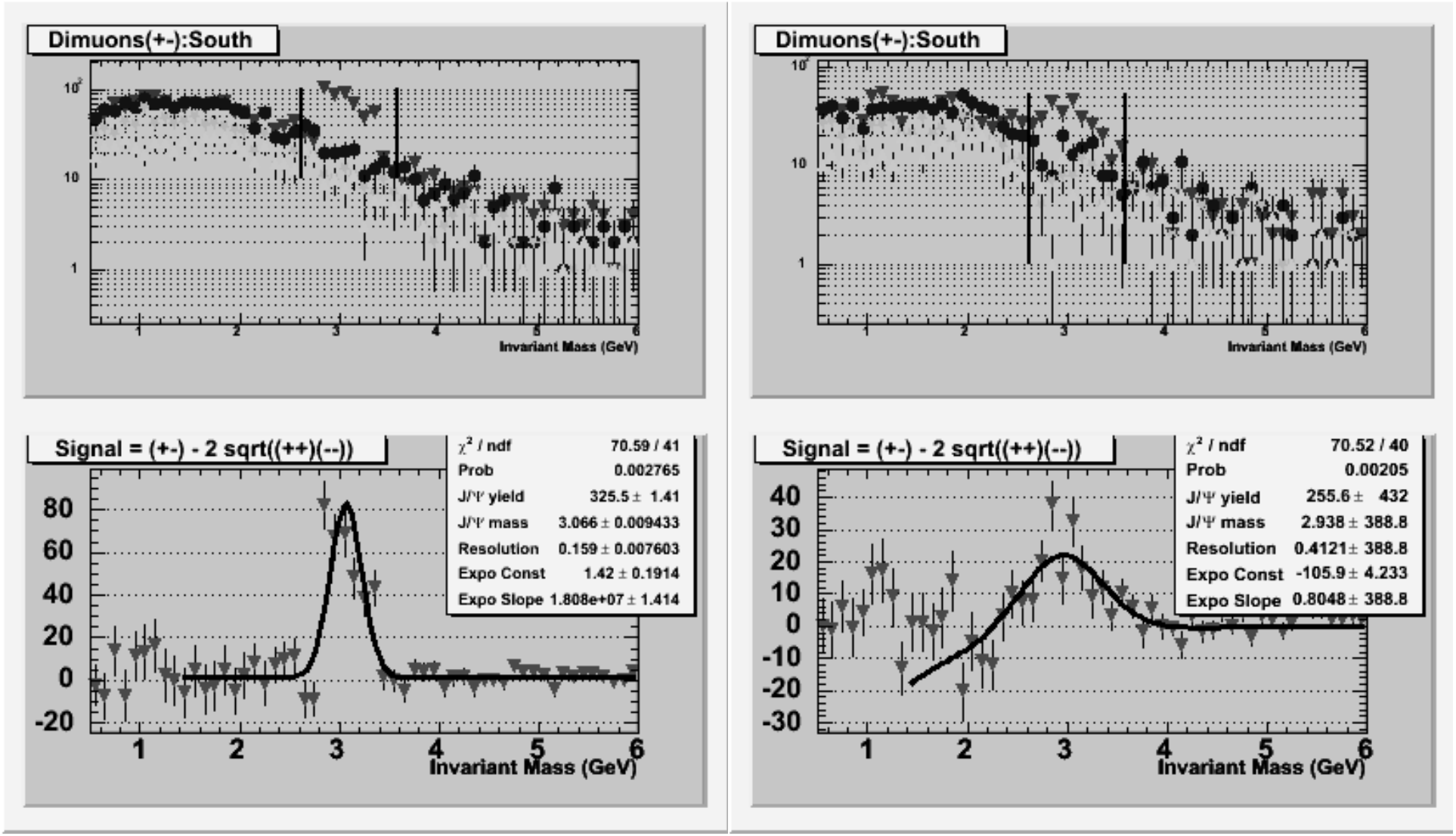
```
Tr0_pz<0&&Tr1_pz<0&&rap< -1.2&&rap> -2.2&&
abs(divtx_z)<=40&&abs(Evt_bbcZ-divtx_z)<0.2&&divtx_chi<50&&
!(Tr0_mutr_nhits<13&&Tr1_mutr_nhits<13)&&
!(Tr0_muid_nhits<10&&Tr1_muid_nhits<10)&&
mulDhits0>256&&mulDhits1>256&&chi0<50&&
chi1<50&&dS30<=50&&dS31<=50)
```

=> NORTH

```
Tr0_pz>0&&Tr1_pz>0&&rap>1.2&&rap<2.4&&
abs(divtx_z)<=40&&abs(Evt_bbcZ-divtx_z)<0.2&&divtx_chi<50&&
!(Tr0_mutr_nhits<13&&Tr1_mutr_nhits<13)&&
!(Tr0_muid_nhits<10&&Tr1_muid_nhits<10)&&
mulDhits0>256&&mulDhits1>256&&chi0<50&&
chi1<50&&dS30<=25&&dS31<=25)
```

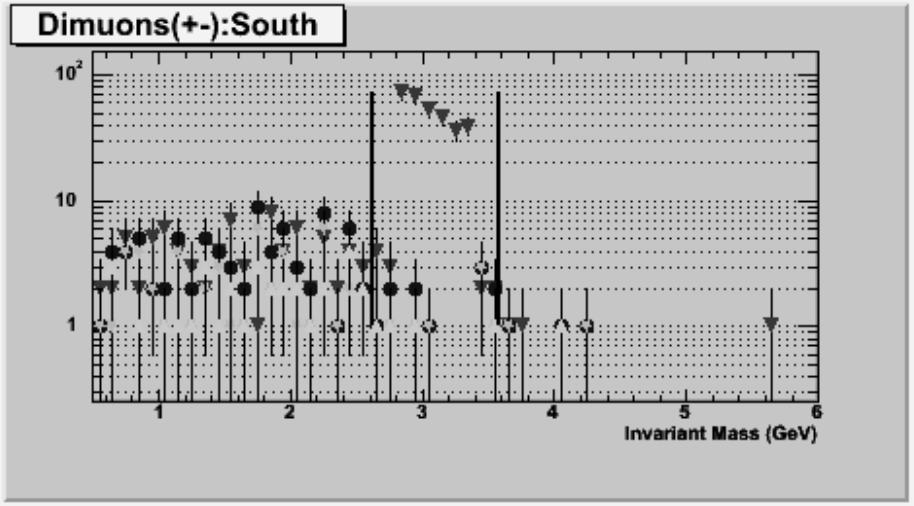
# Mass distribution : south

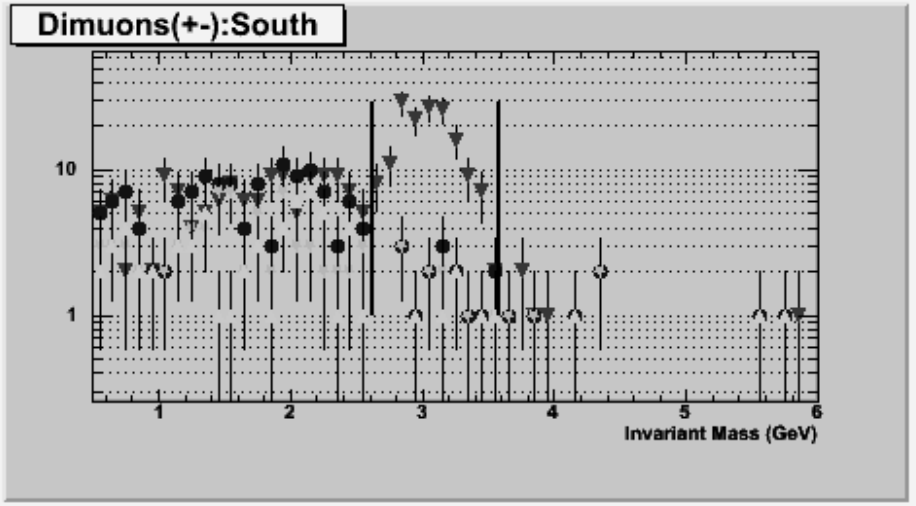
# 1. without any cut (Left: pro build, Right: new build)

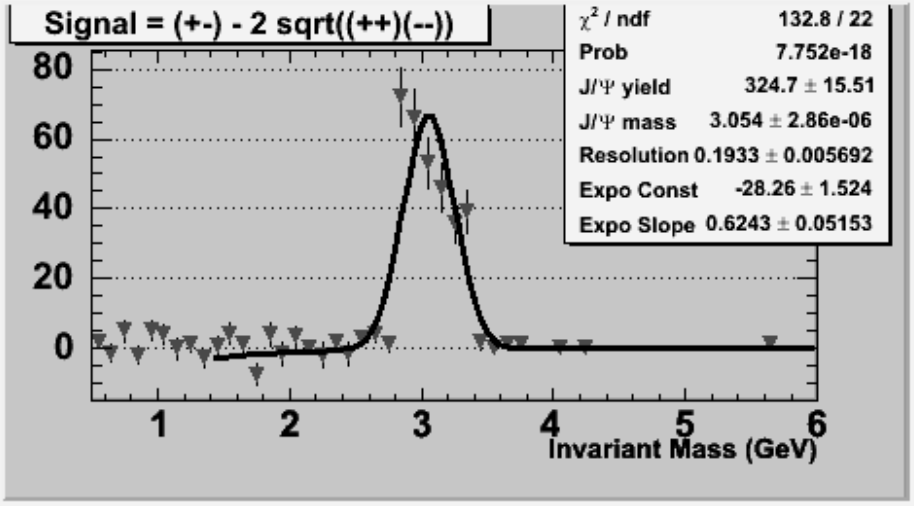


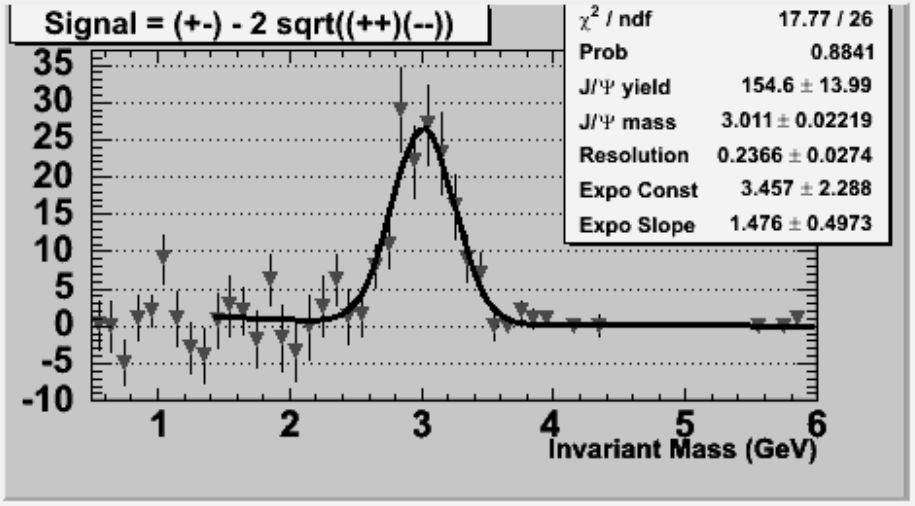

J/Psi peak shape has been changed at new build. The number of J/Psi quite diff.
Let's have in mind these samples have been selected from pro build mass range.

# Mass distribution : south
# 2. with cut A (Left: pro build, Right: new build)



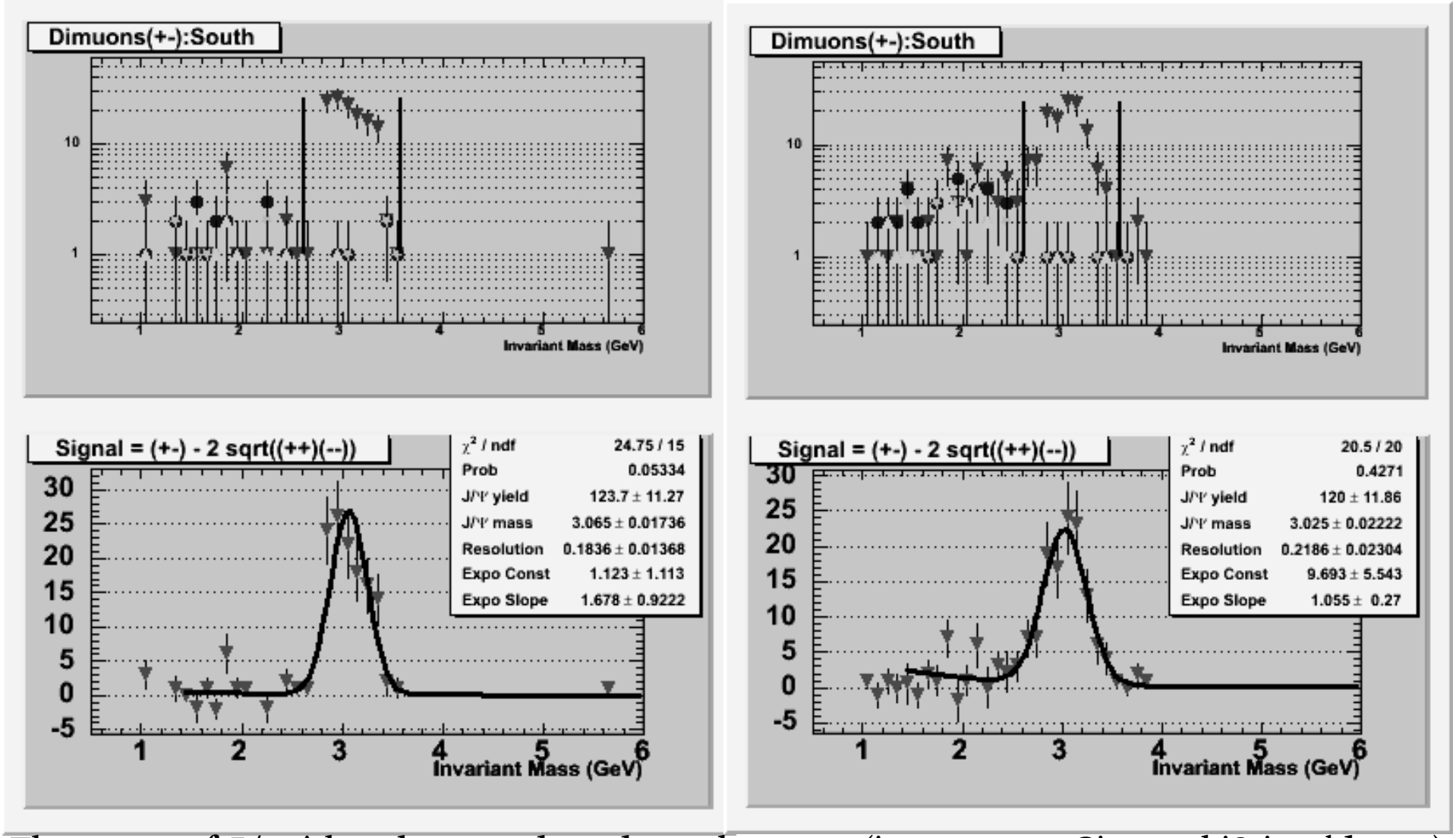



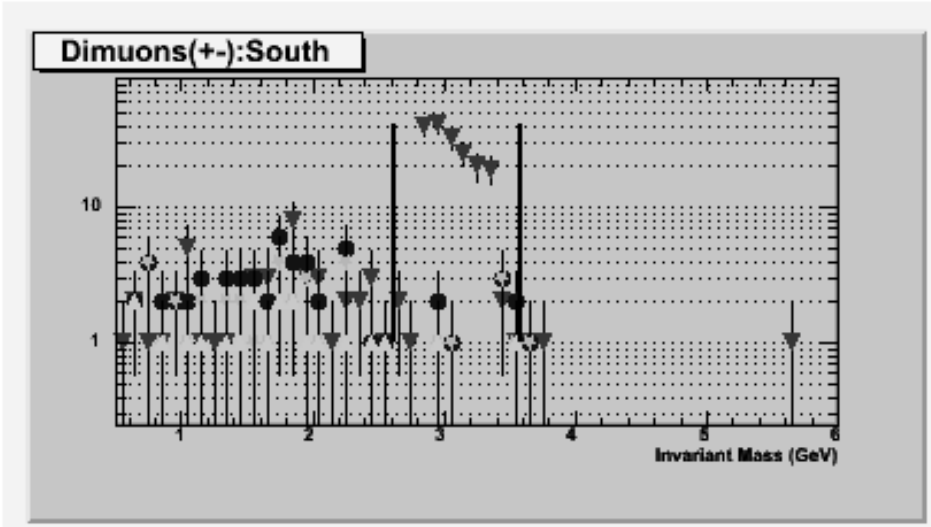

Let's see.. When we selected samples from pro build, we already gave similar cuts
So the pro built mass distribution didn't get significant effect from this cut.
The new lib plot gives much more good shape.

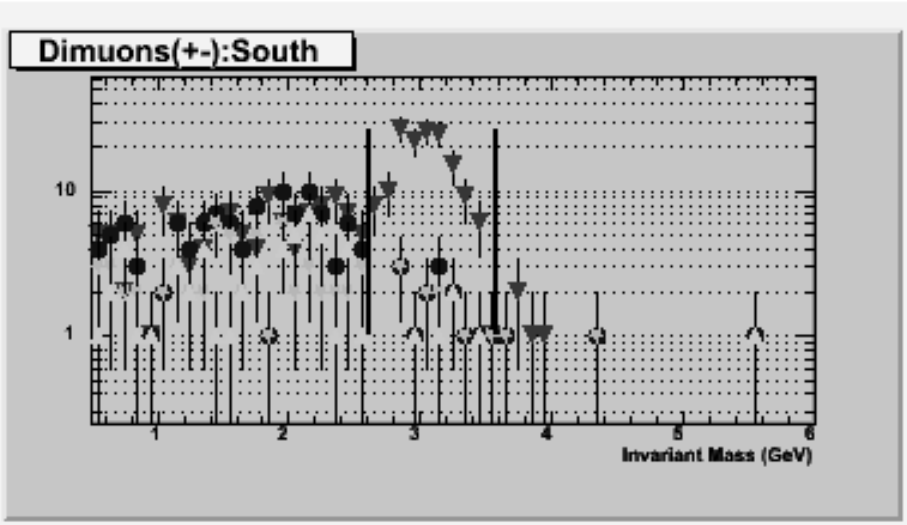
# Mass distribution : south
# 3. with more strict cut [chi2<20, DS3<30, angle>20]
# (Left: pro build. Right: new build)

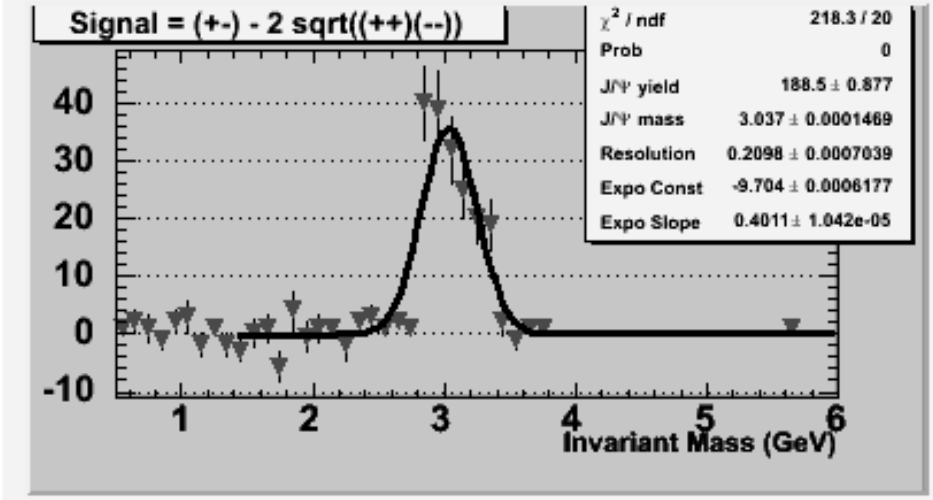


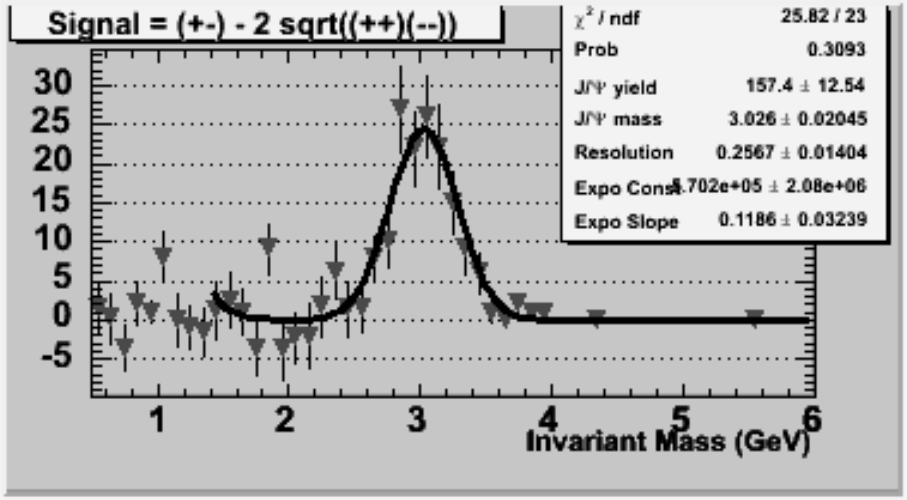

The num. of J/psi has been reduced much more. (ignore pro. Since chi2 is old ver.)
Which cut is the most effective one? Let's try the above cut one by one ->next page

# Just change from chi2<50 to chi2<20 on cut A



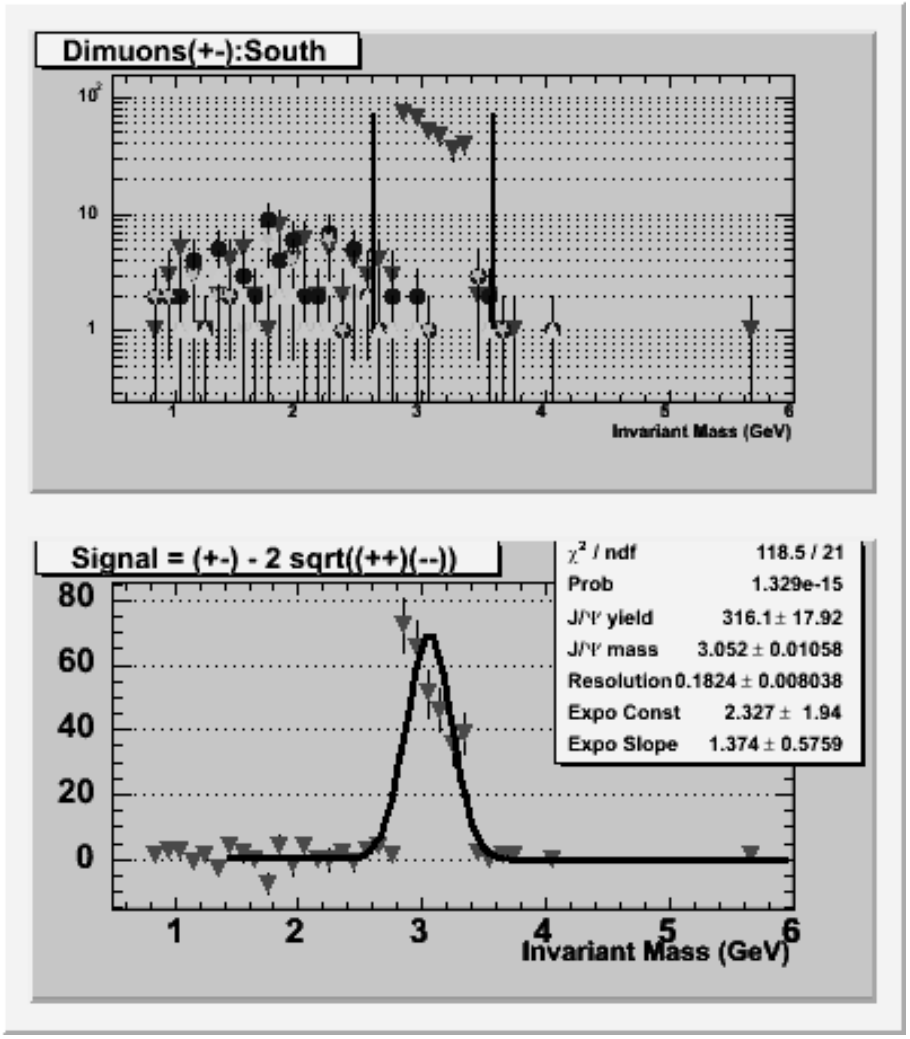



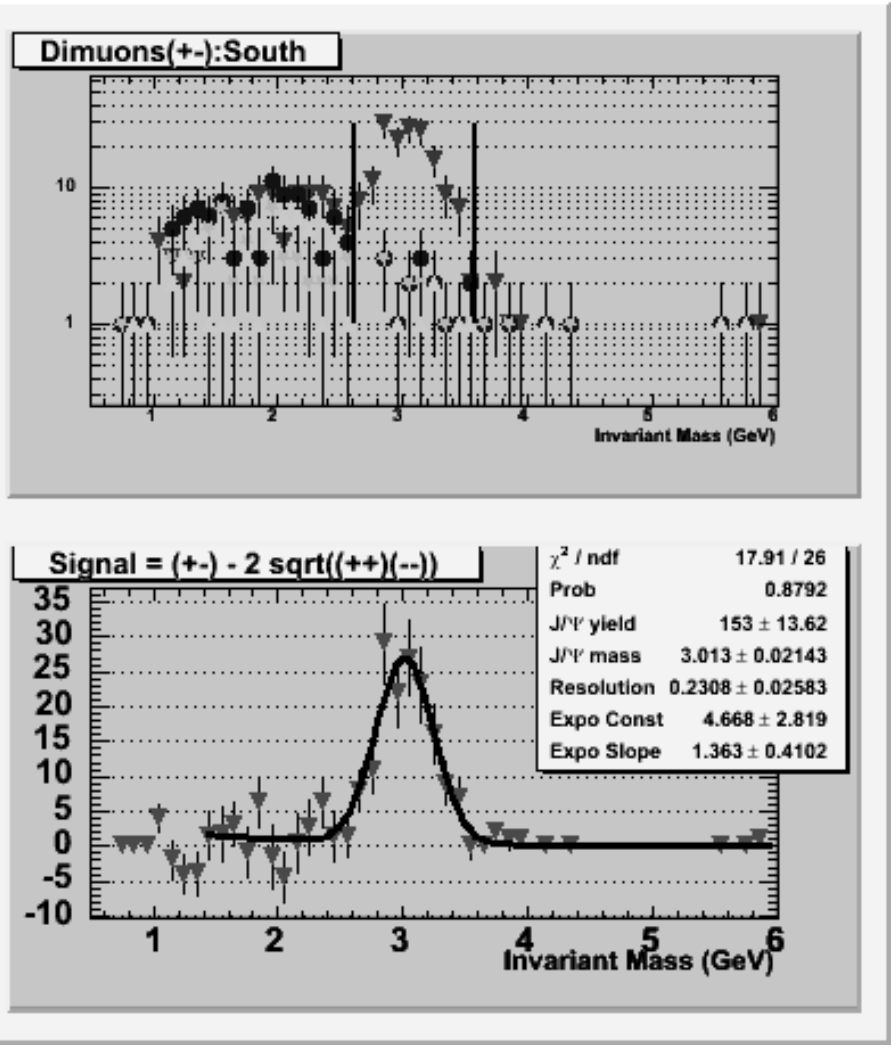




Doesn't give much change to new lib. (do not care about pro)

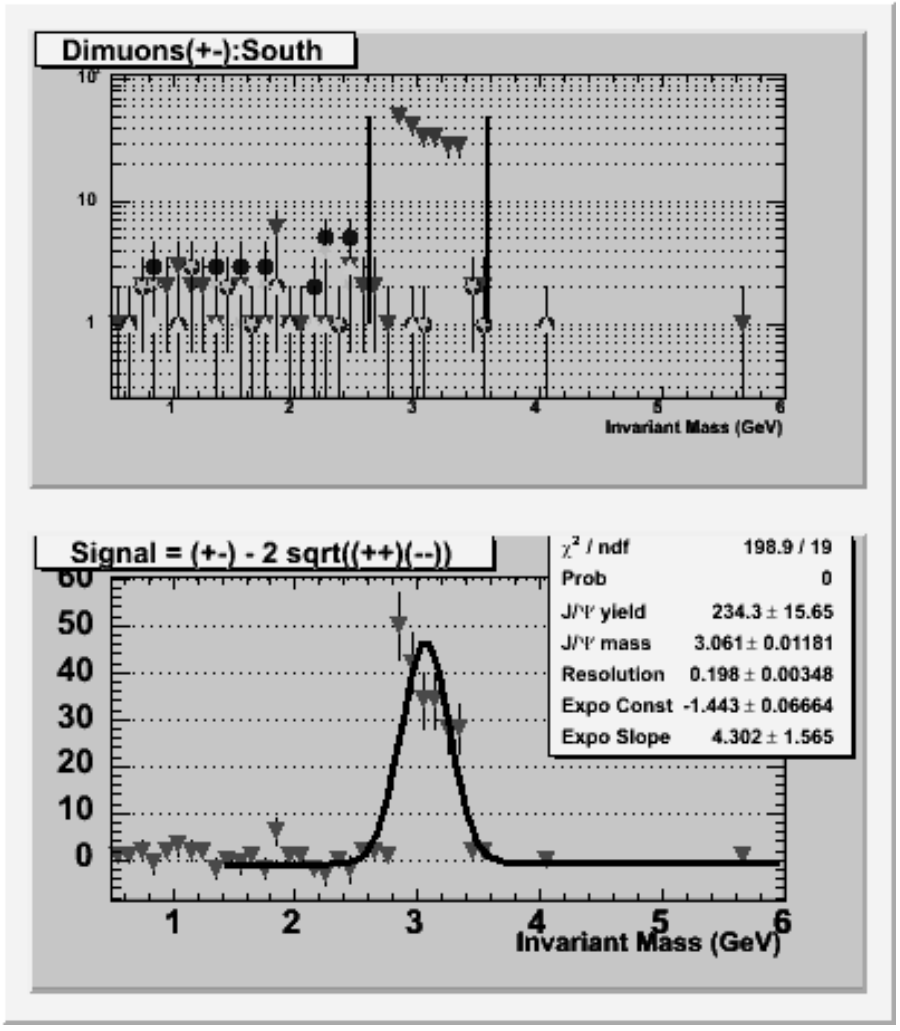
# Just make an open angle>20 cut on cut A

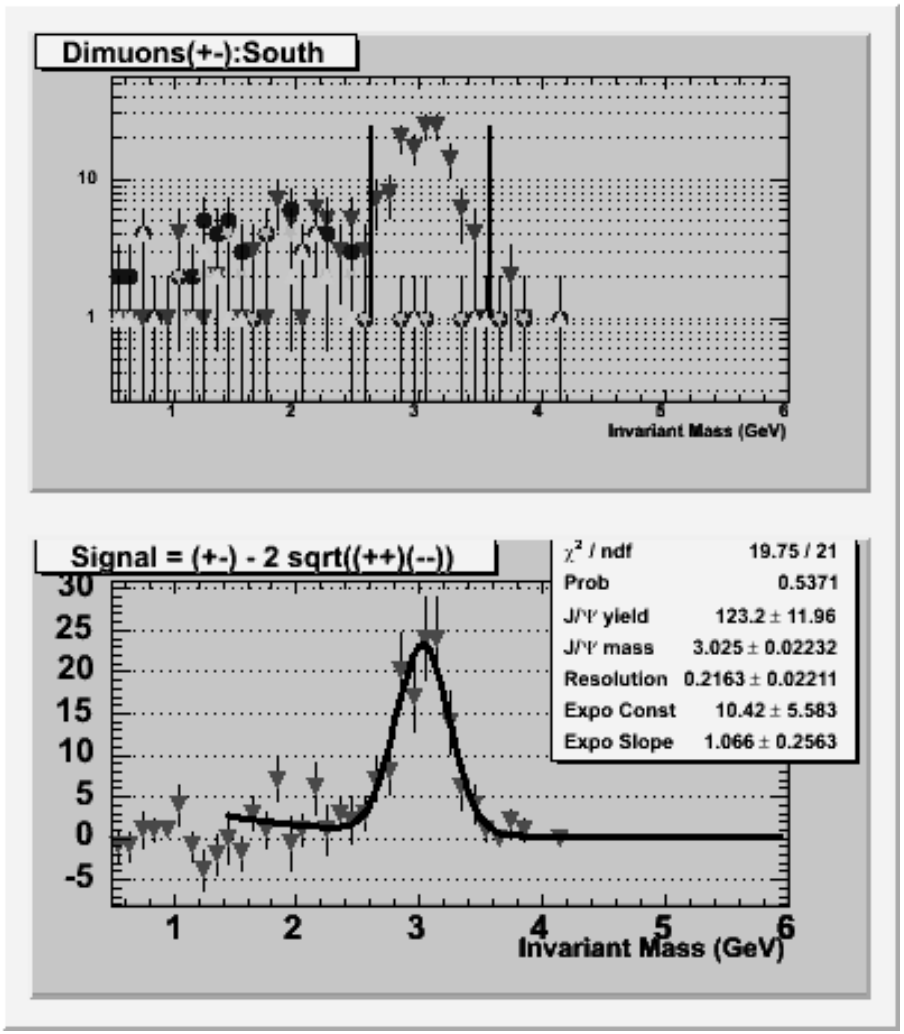



Doesn't give much change to new lib.

# Just change from DS3<50 to DS3<30 on cut A

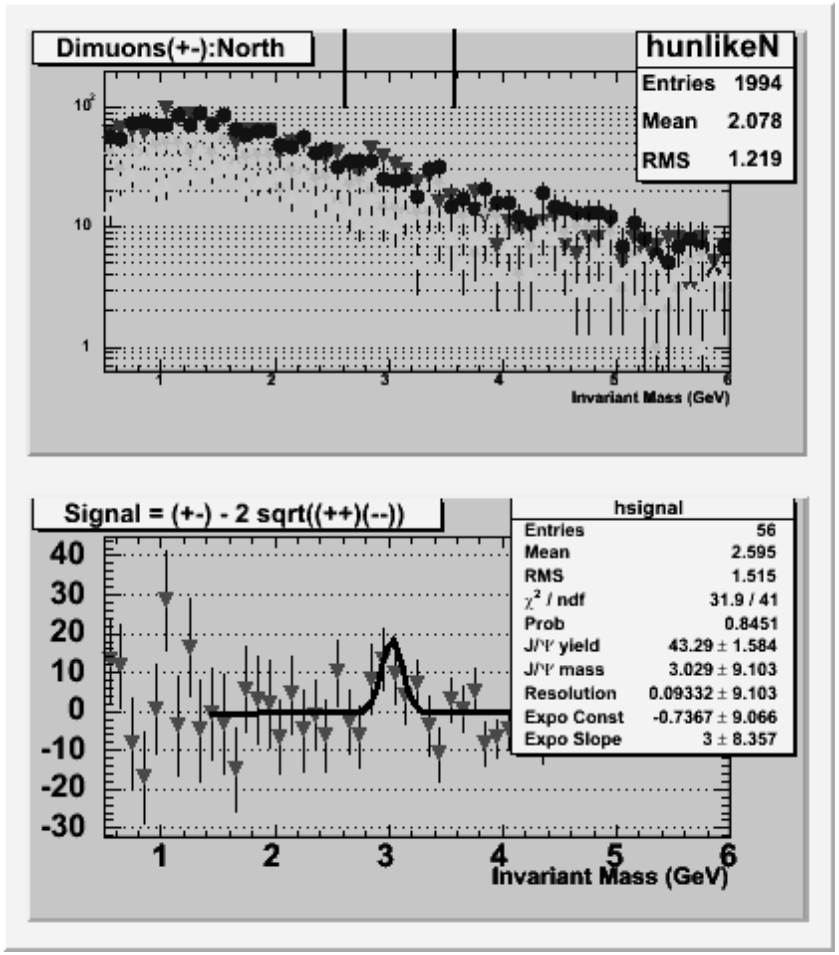


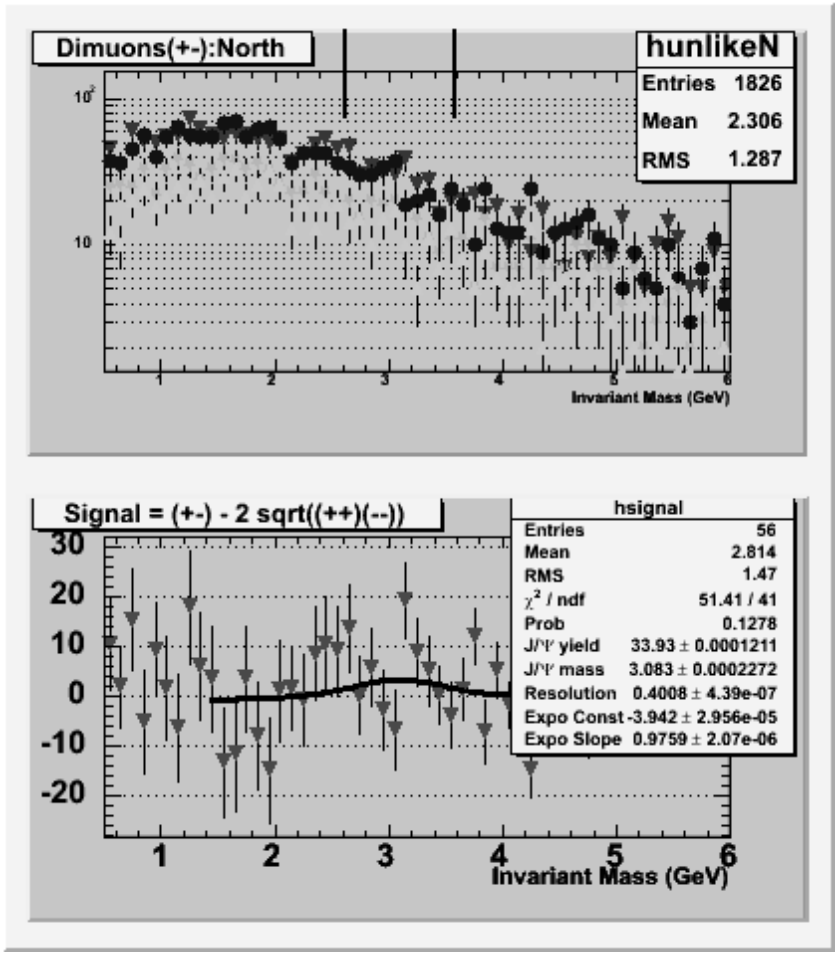




This DS3 cut is most responsible to the distribution changes, but resolution better?

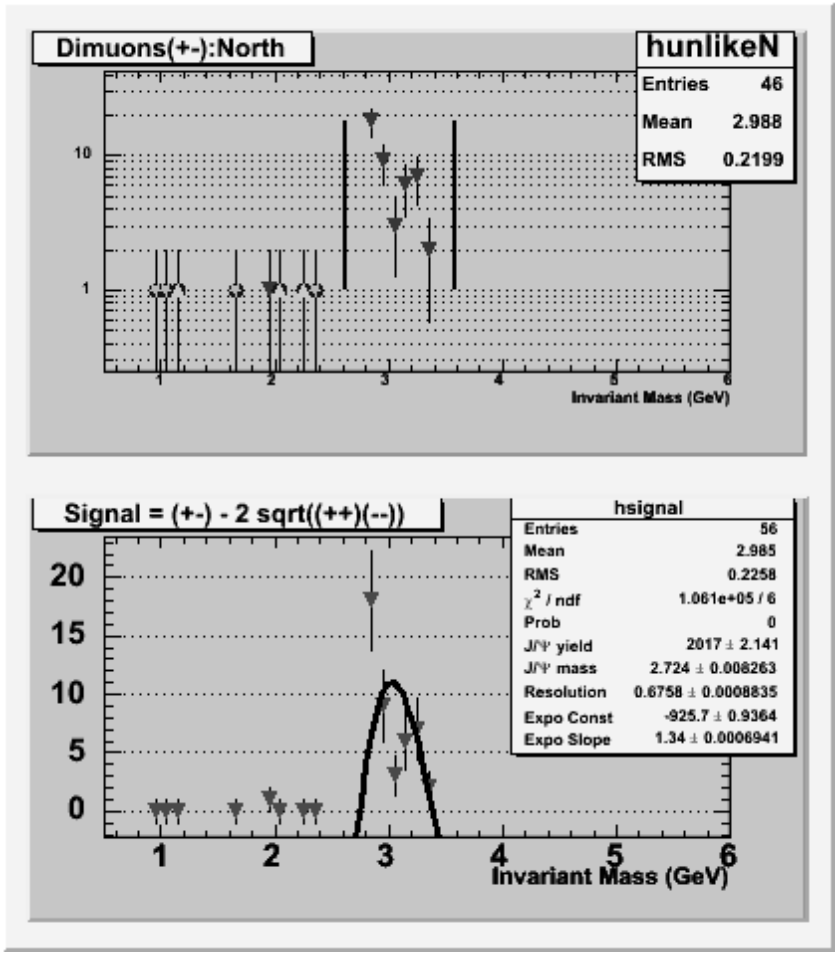
# Mass distribution : north

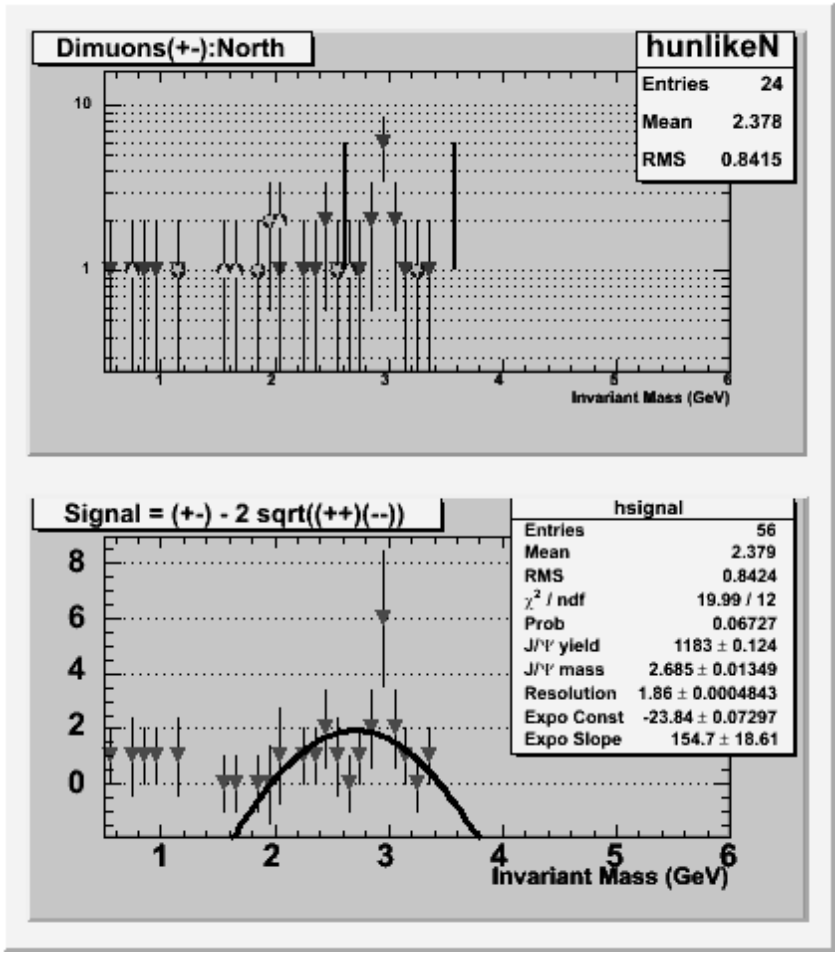
# 1. without any cut (Left: pro build, Right: new build)



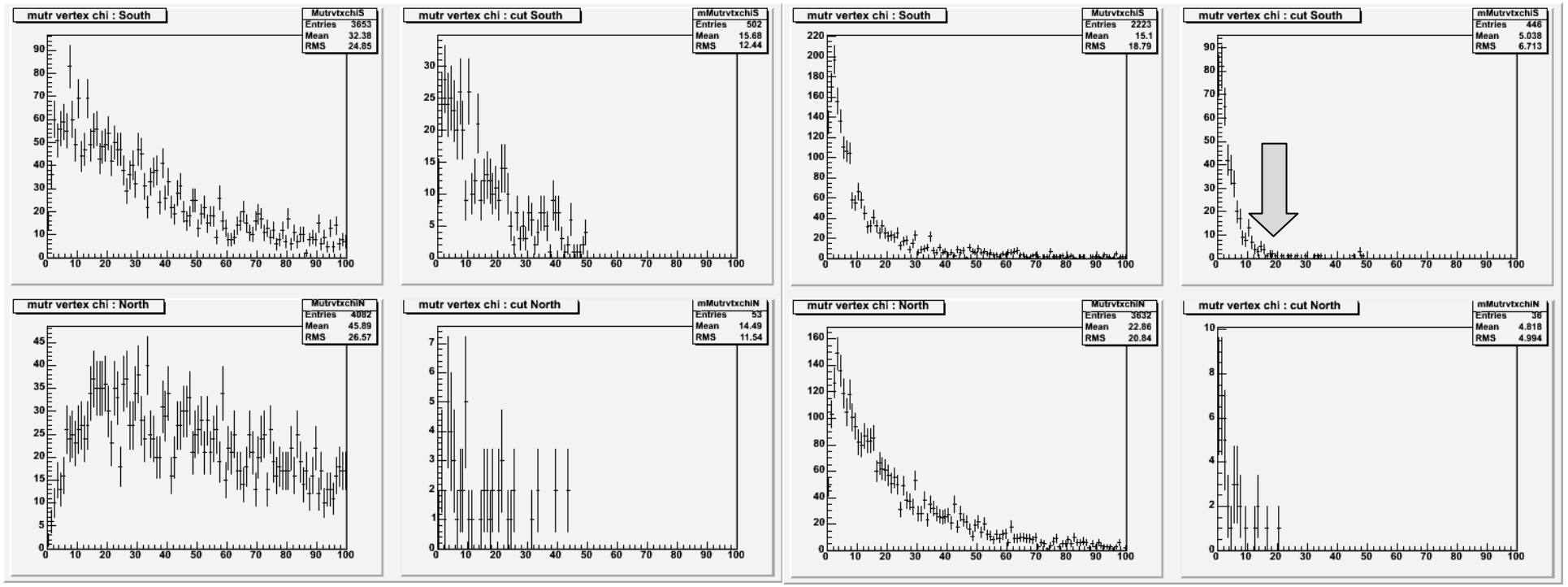
# Mass distribution :north
# 2. with cut A (Left: pro build, Right: new build)



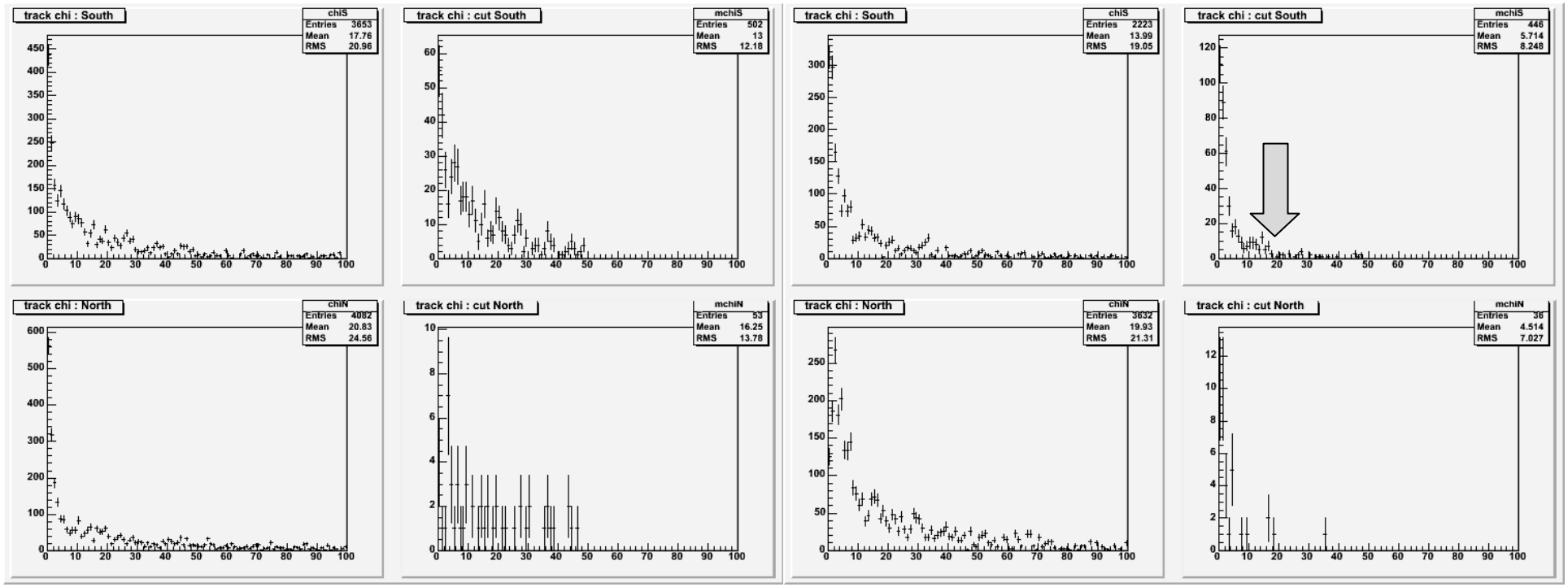
# Vertex chi2 dist. before & after cut A

(left two: pro build, right two: new build)
(left 1st : before cut A, left 2nd: after cut A, same as right plots)
(upper: south, lower: north)



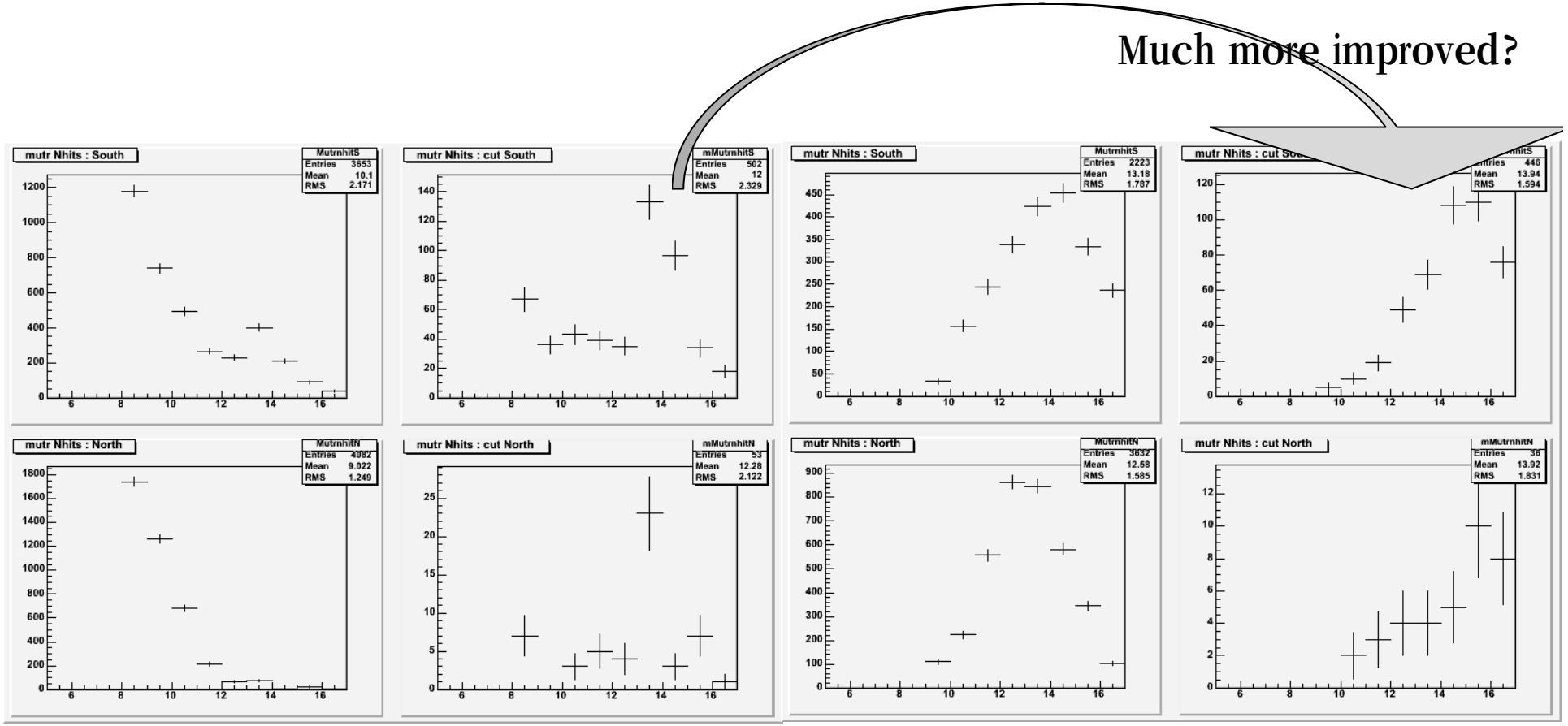
# Track chi2 dist. before & after cut A

## (same convention)



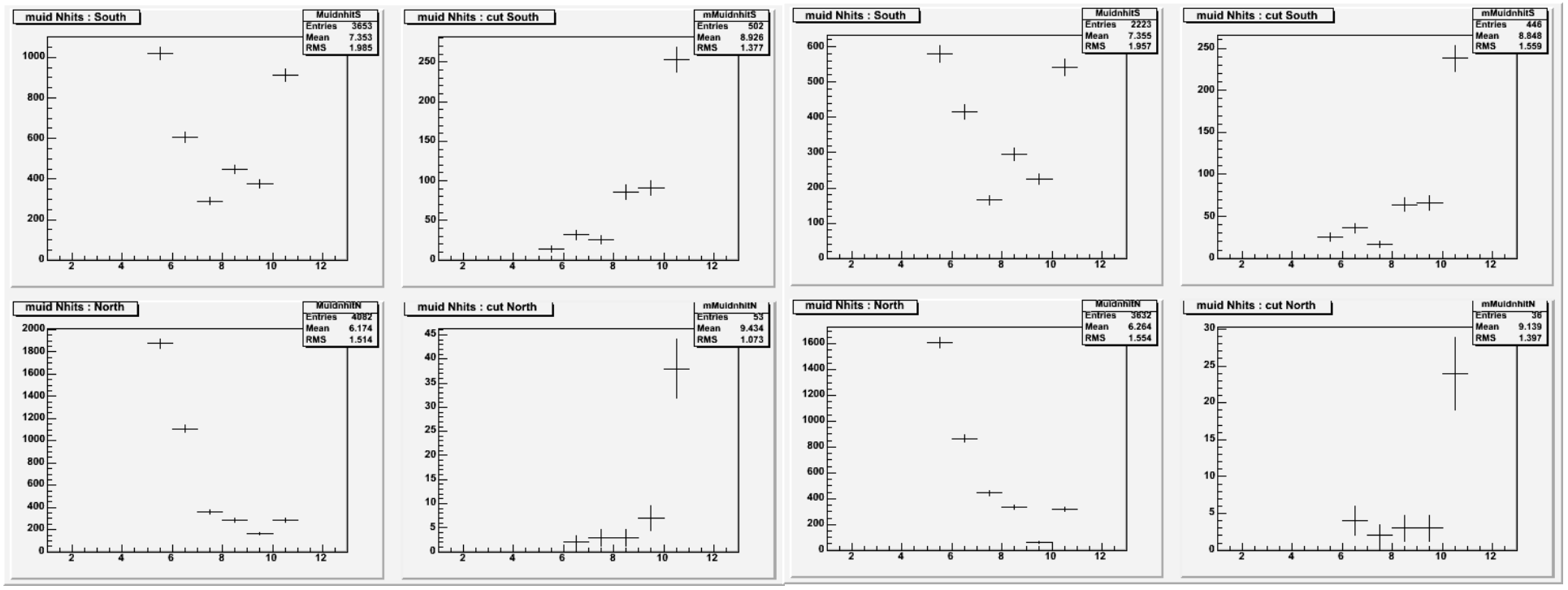
# Mutr nhits dist. before & after cut A

(same convention)



# Muid nhits dist. before & after cut A)

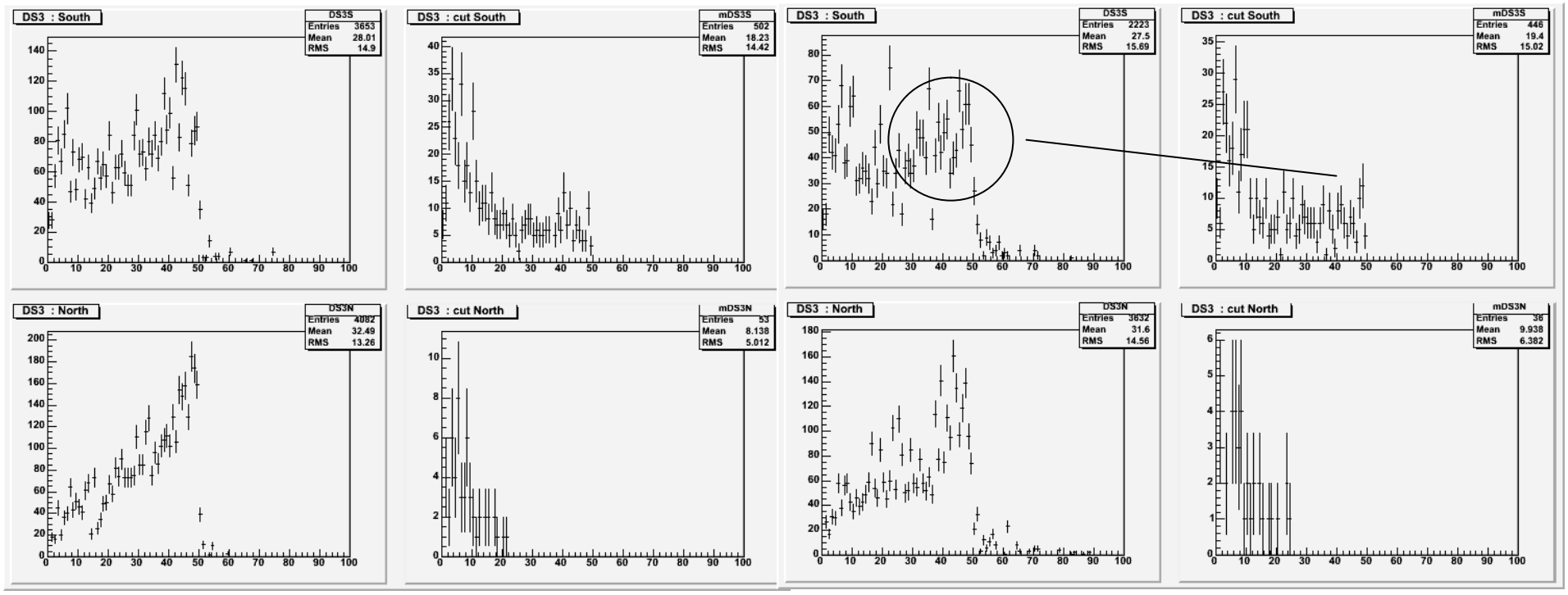
## (same convention)



# DS3 dist. before & after cut A

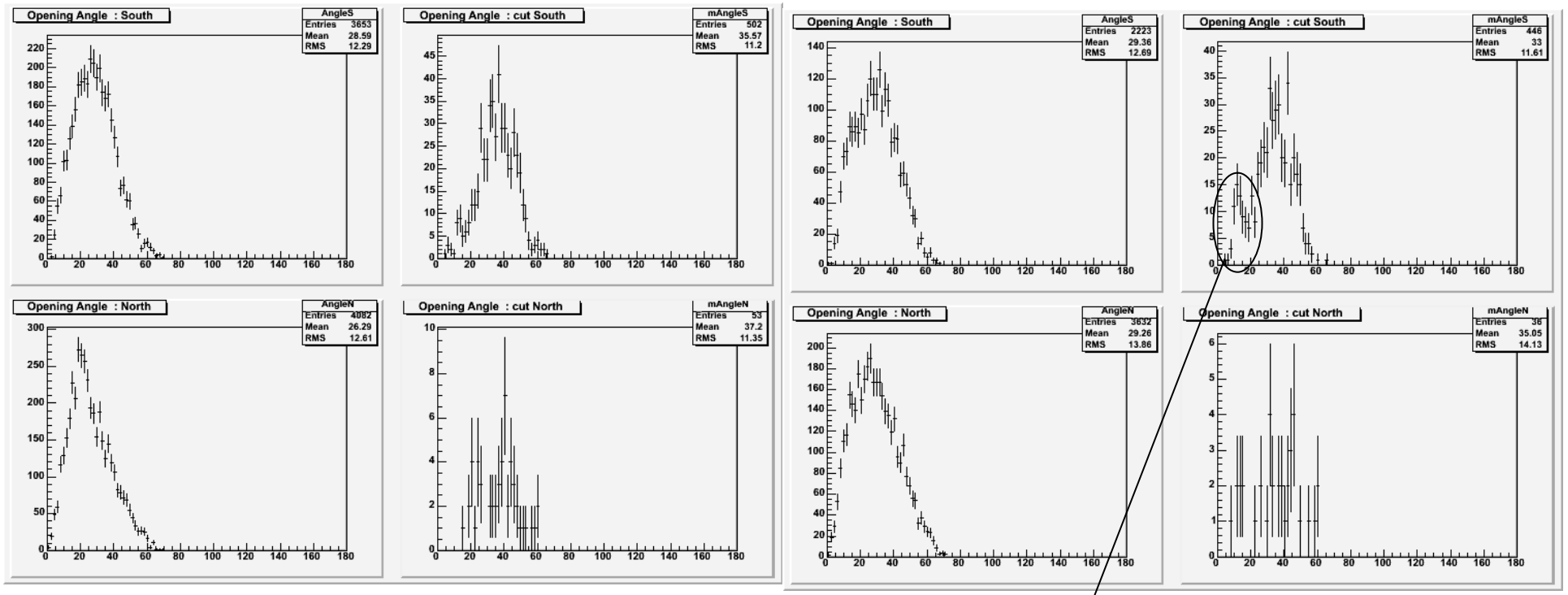
(same convention)

Many high DS3 tracks have gone by other cut (same as pro.)



# Open angle dist. before & after cut A

(same convention)




Is this reasonable to make a cut at 20?
->looks reasonable from slide 7

# Zero supp. study with golden samples

- Comparison of results from zero supp. SHAPE Mode turn on versus off with golden dimuon samples
- About 500 J/Psi candidates(from pro.52 version) were used for this this study
- Tested with recent new lib.(built on Mar/12)

# Occupancy

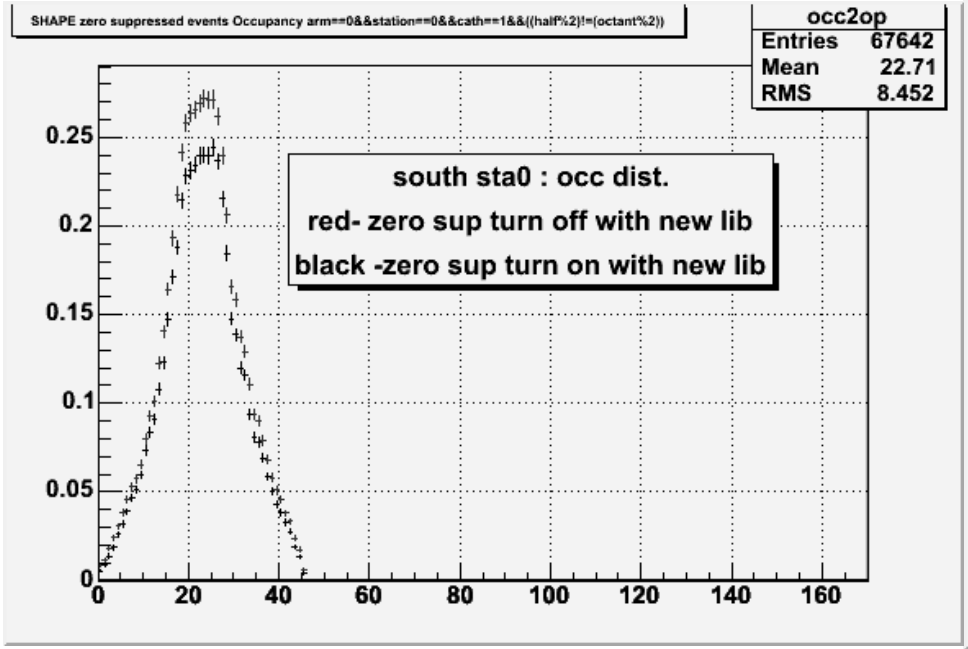
=>by SHAPE mode turning on

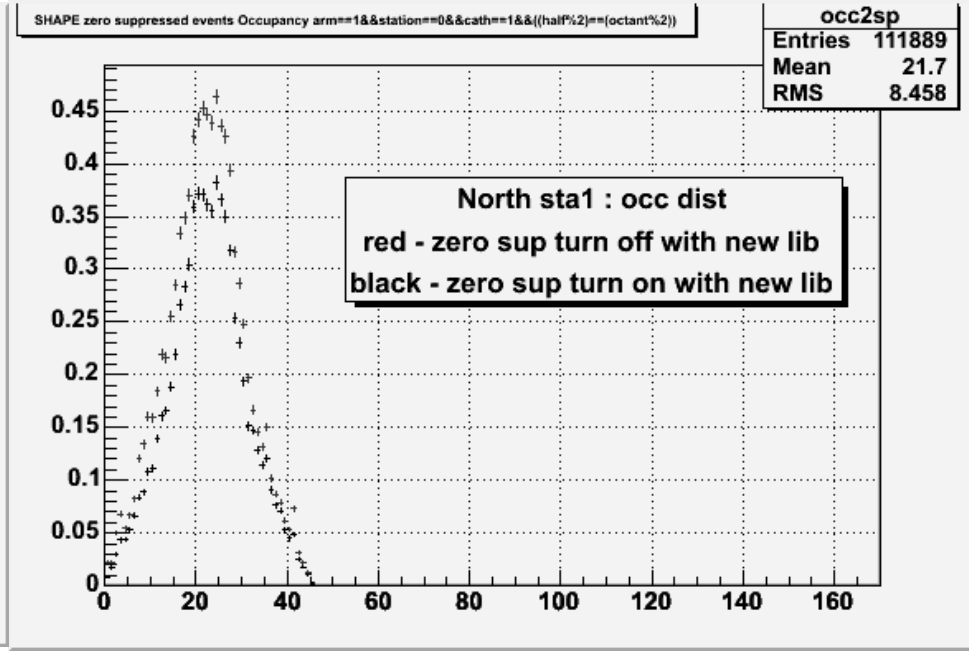
totally (overall for 3 sta.) SOUTH ooc. -> 11% reduced

NORTH ooc. -> 11% reduced

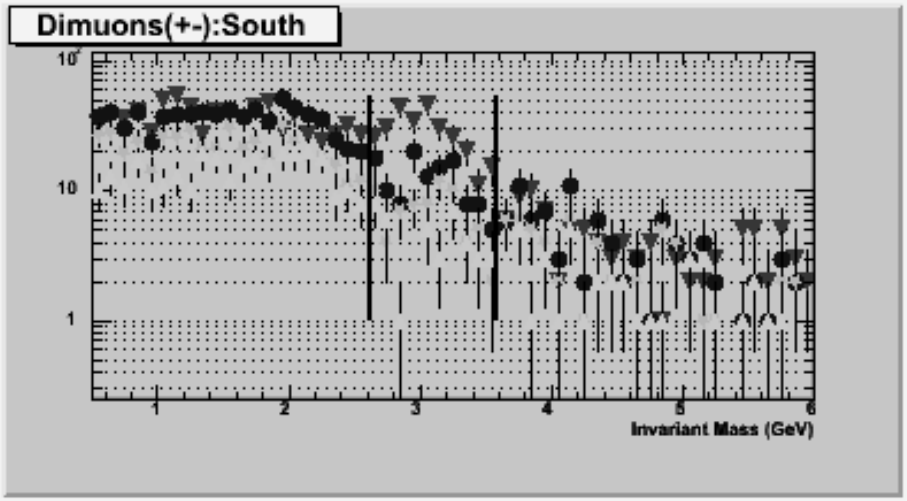
just for station 0 SOUTH ooc. -> 12% reduced

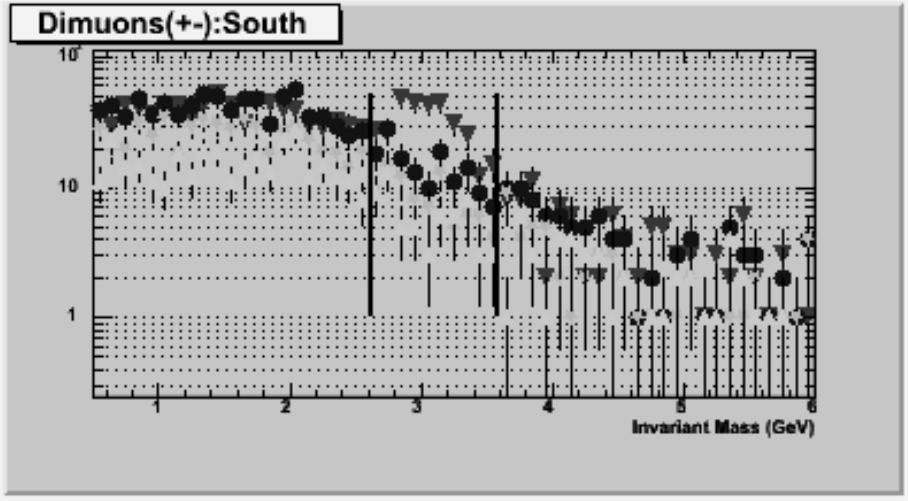
NORTH ooc. -> 15% reduced

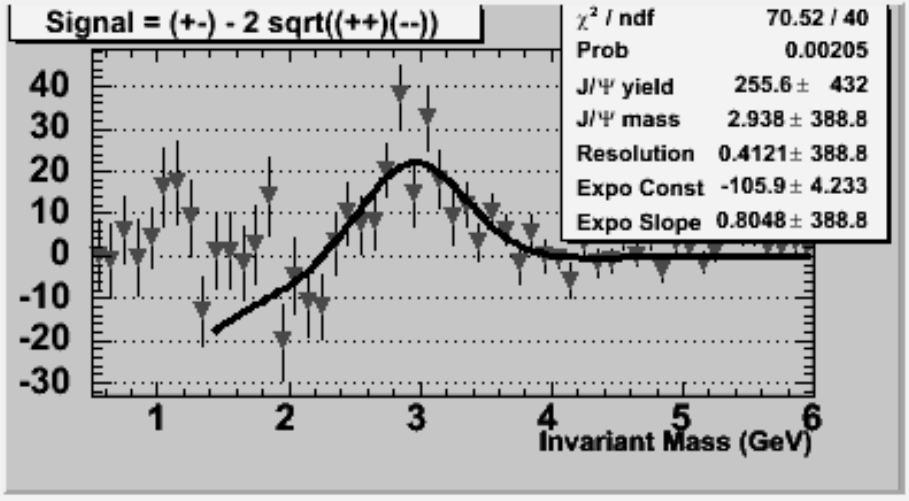


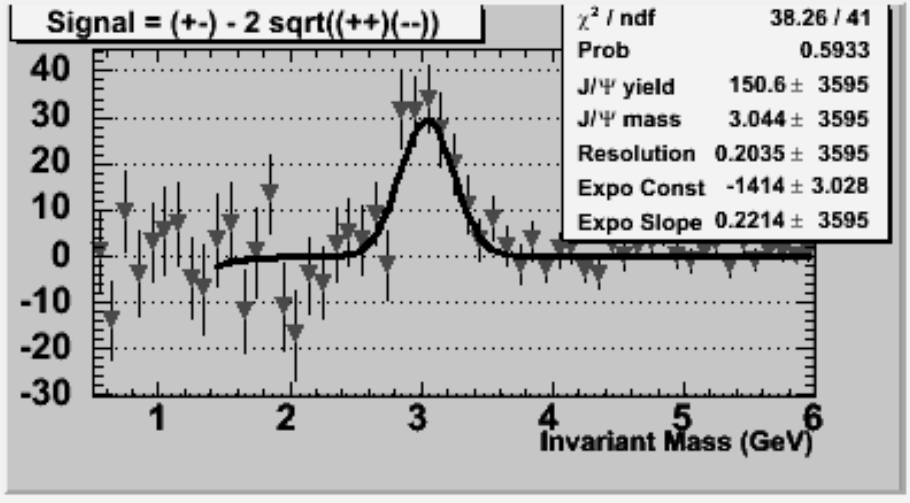



# Mass distribution
# 1. without any cut (Left: SHAPE on, Right: off)



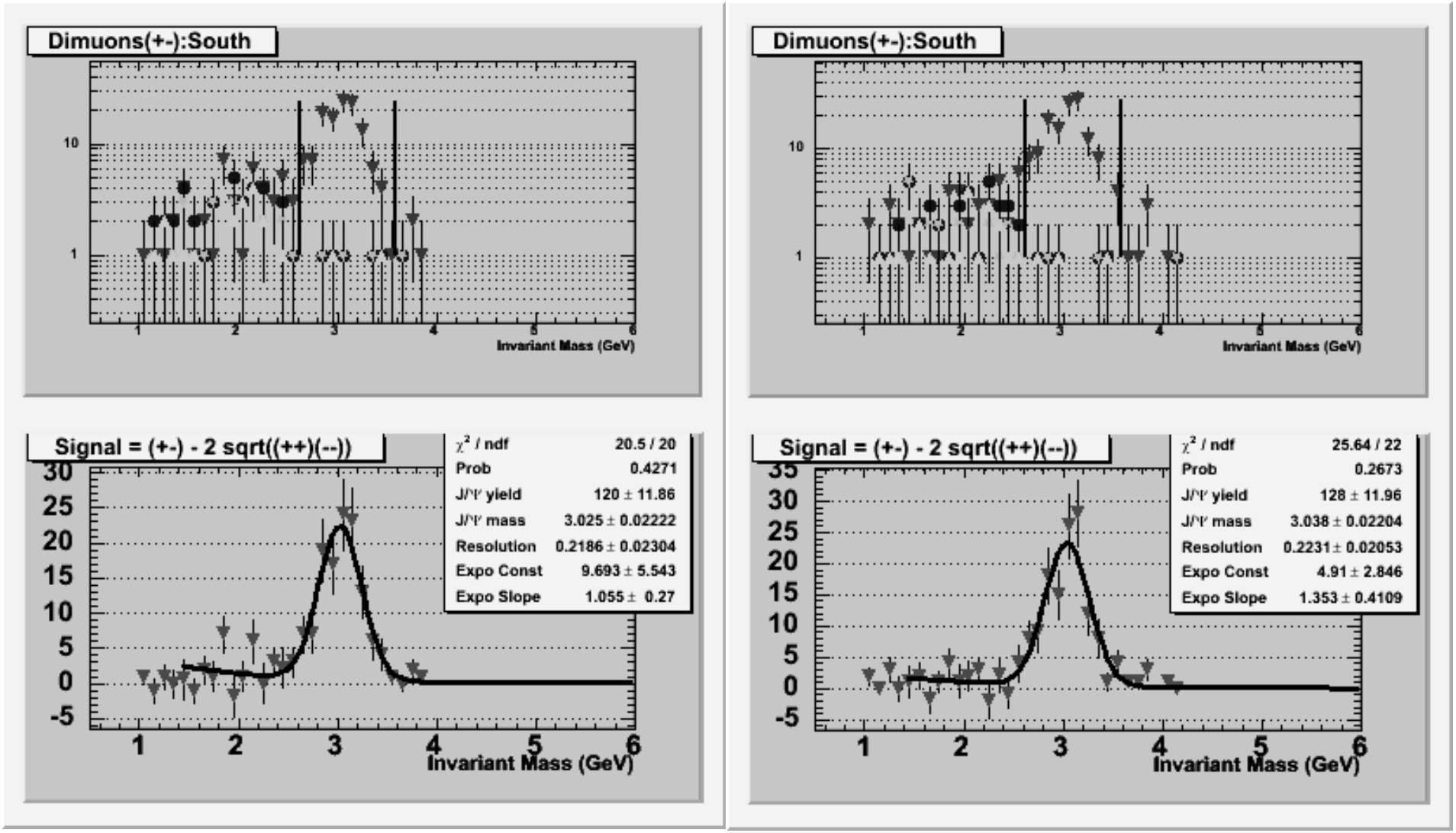




Distribution and number of like and unlike signs looks significantly different, but let's look at after some cuts -> next page

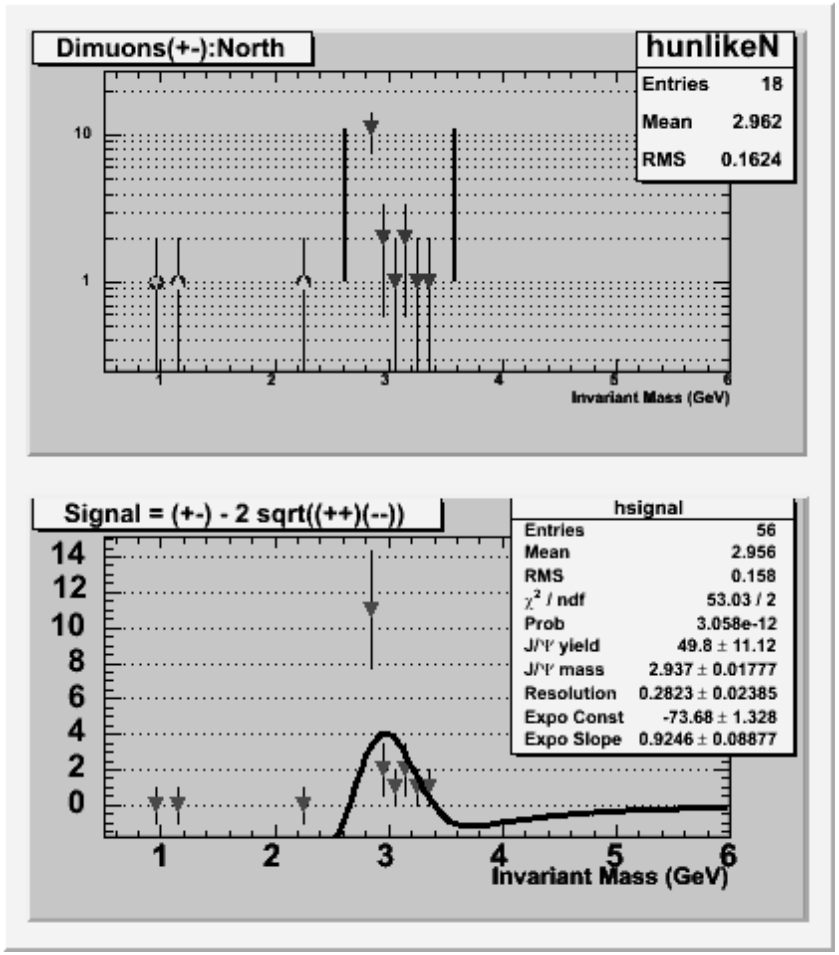
# Mass distribution
# 2. with cut (Left: SHAPE on, Right: off)

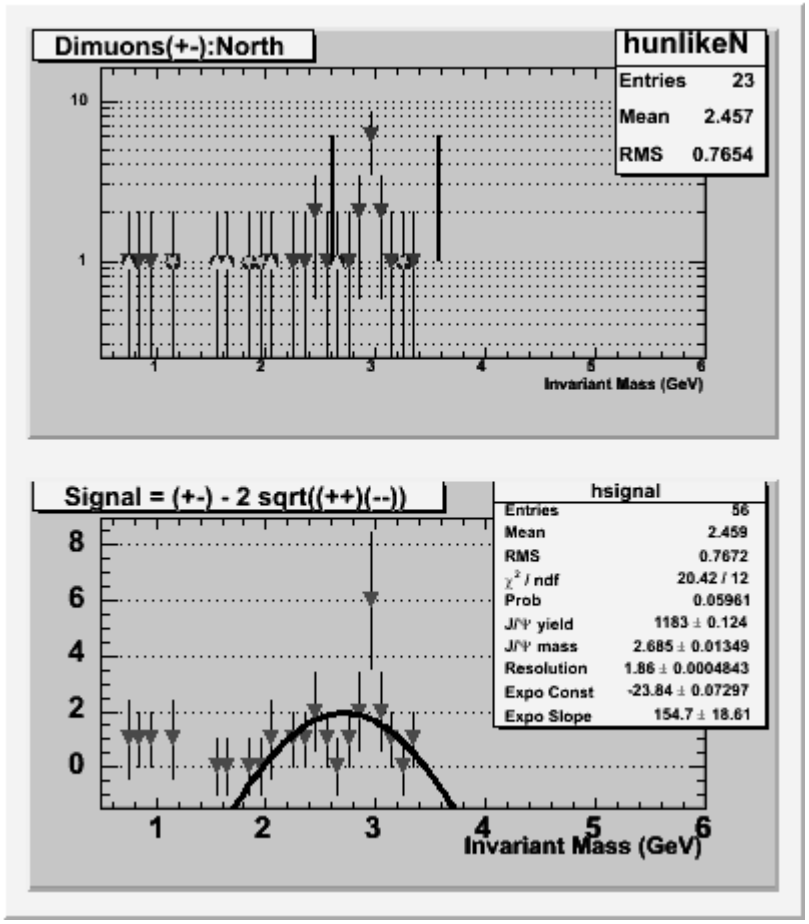



After the cut, now it's not that much different, but still there are some differences
-> we will tag the events which give the differences and take a look at them.

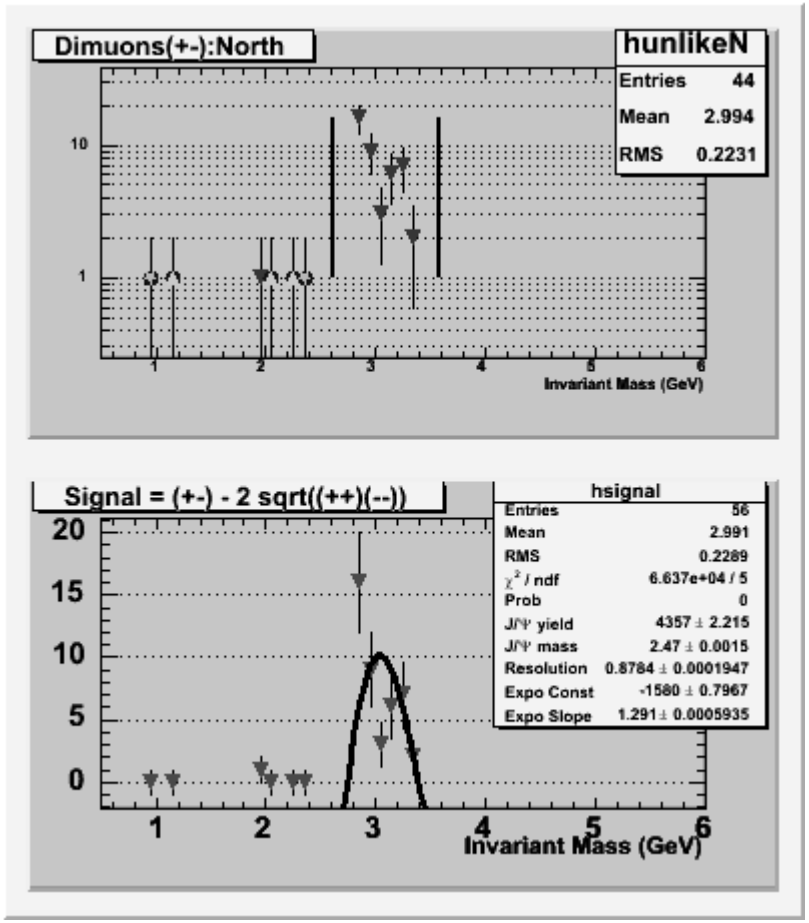
# Backup slides

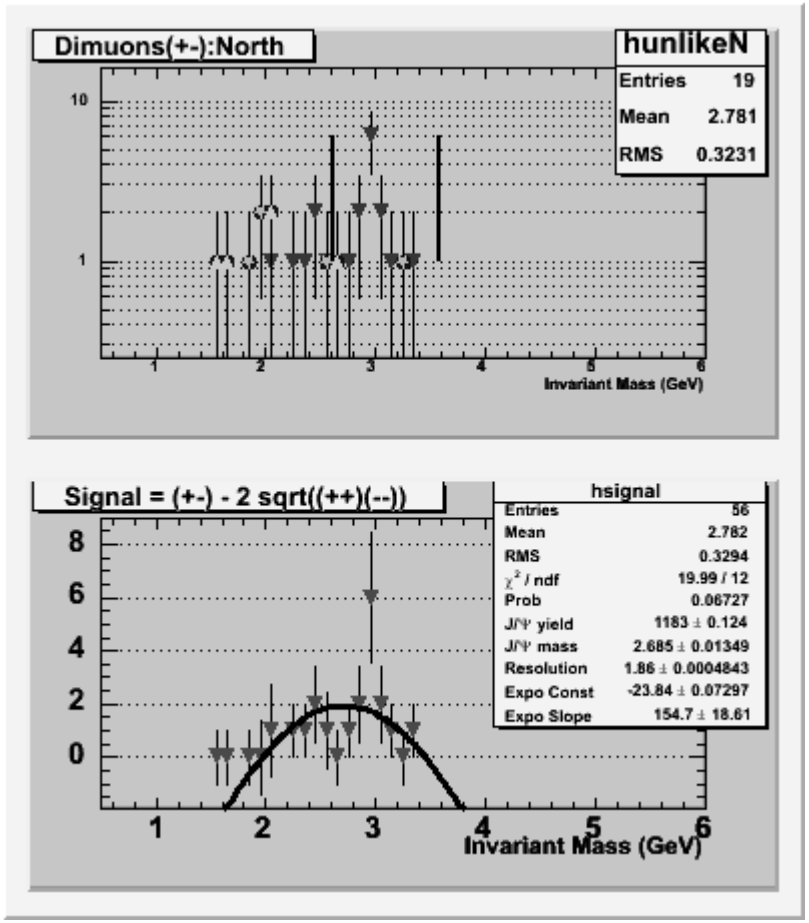
# North : Just change to chi2<20 on cut A



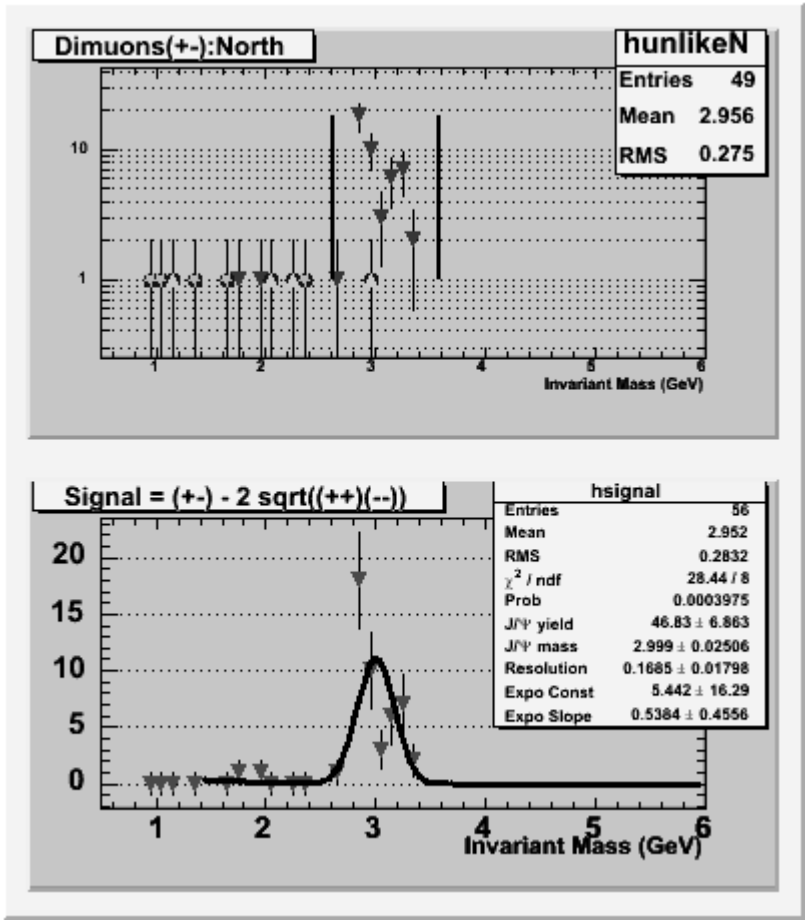



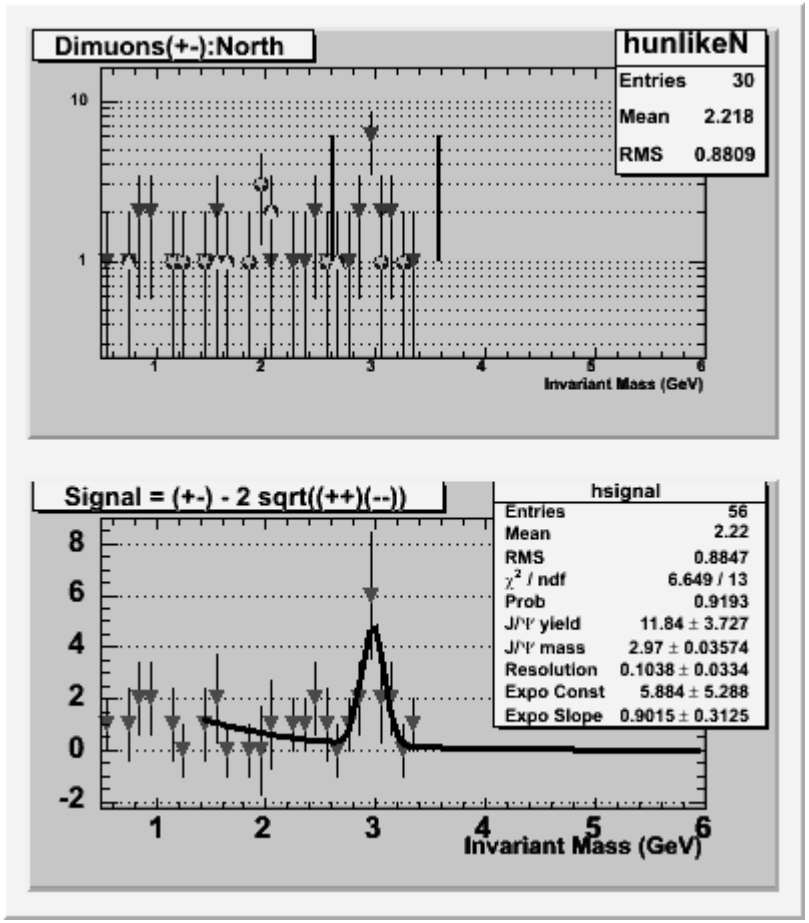
# North : Just change to open angle>20 on cut A



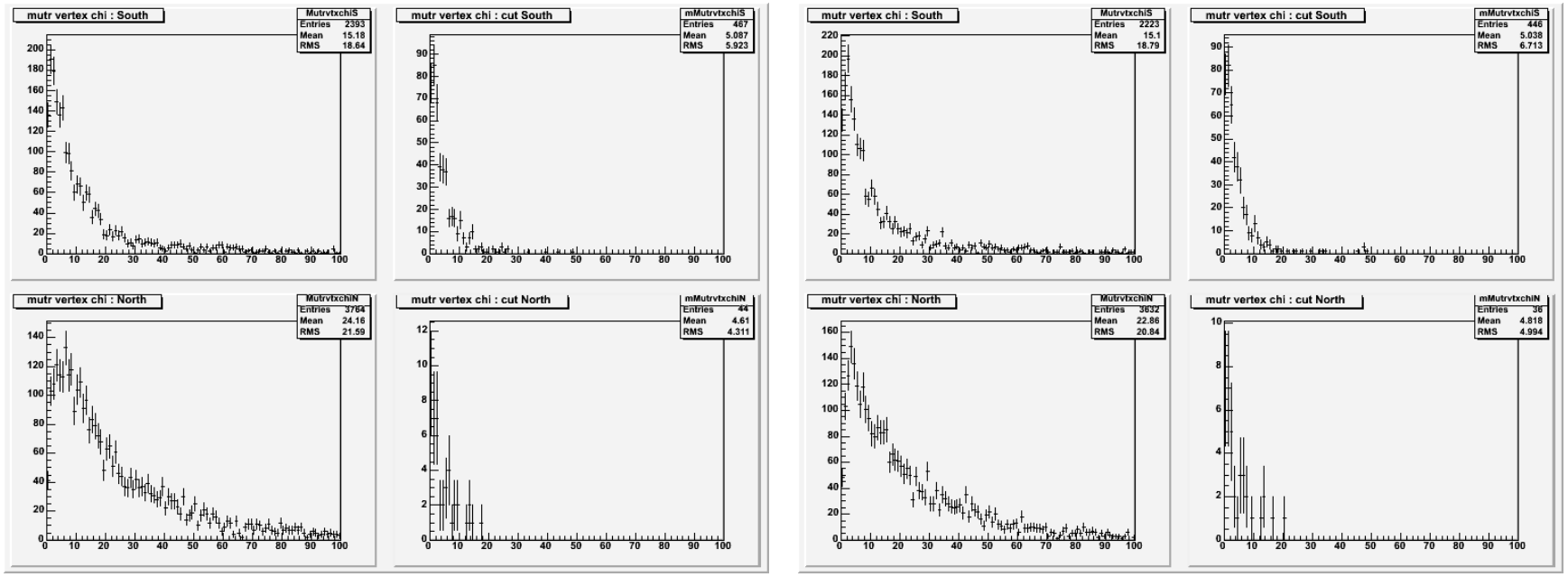
# North: Just change to DS3<30(increased) on cut A



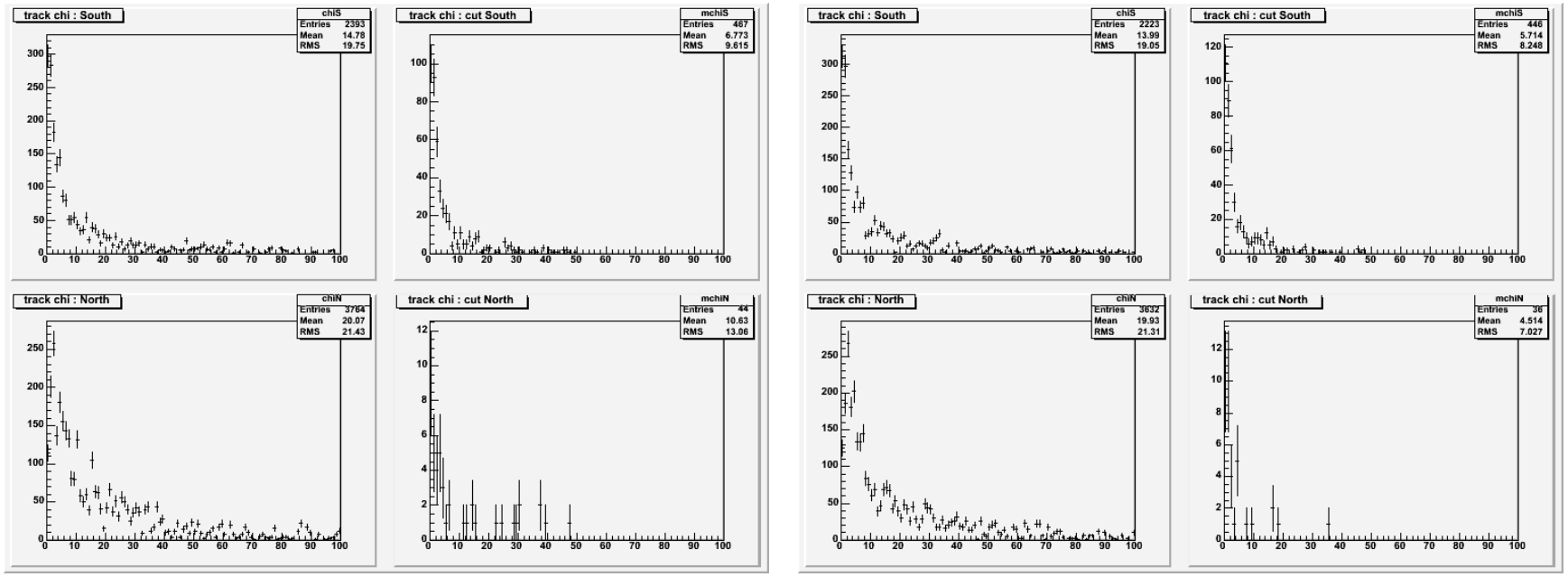



# Occ. Zerosupp. Var. dist. backup

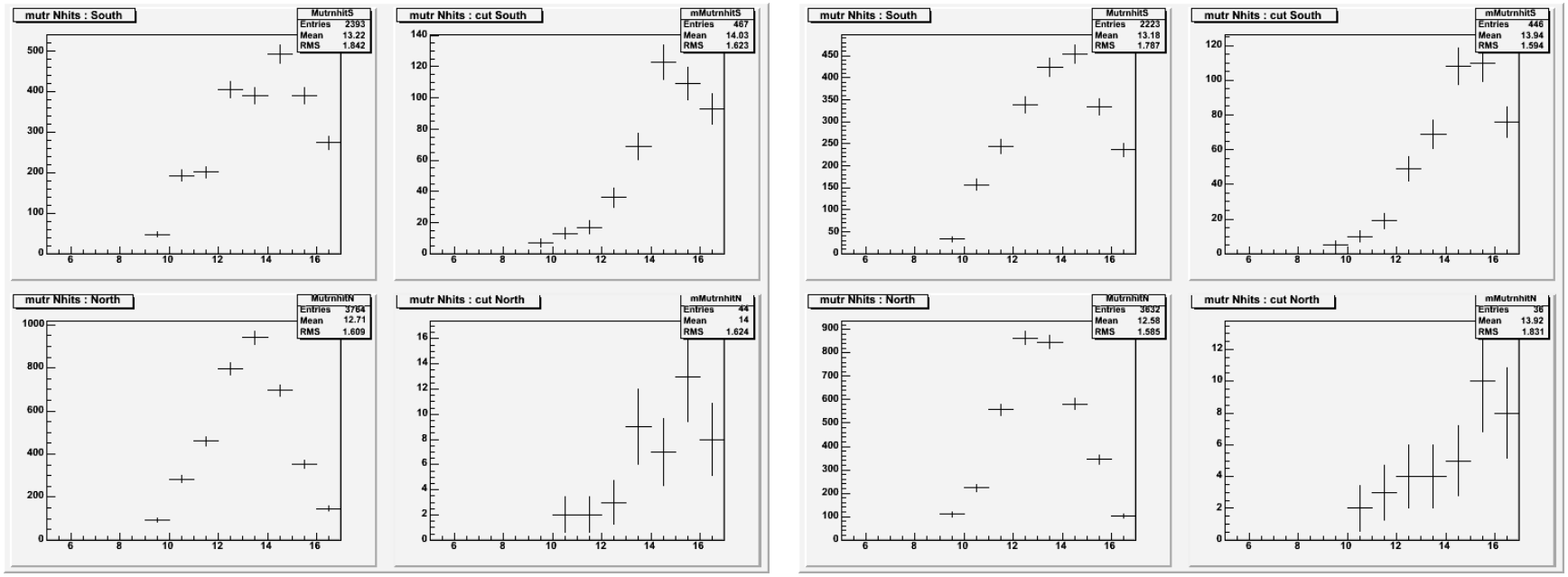
# Vertex chi2 dist. before & after cut A



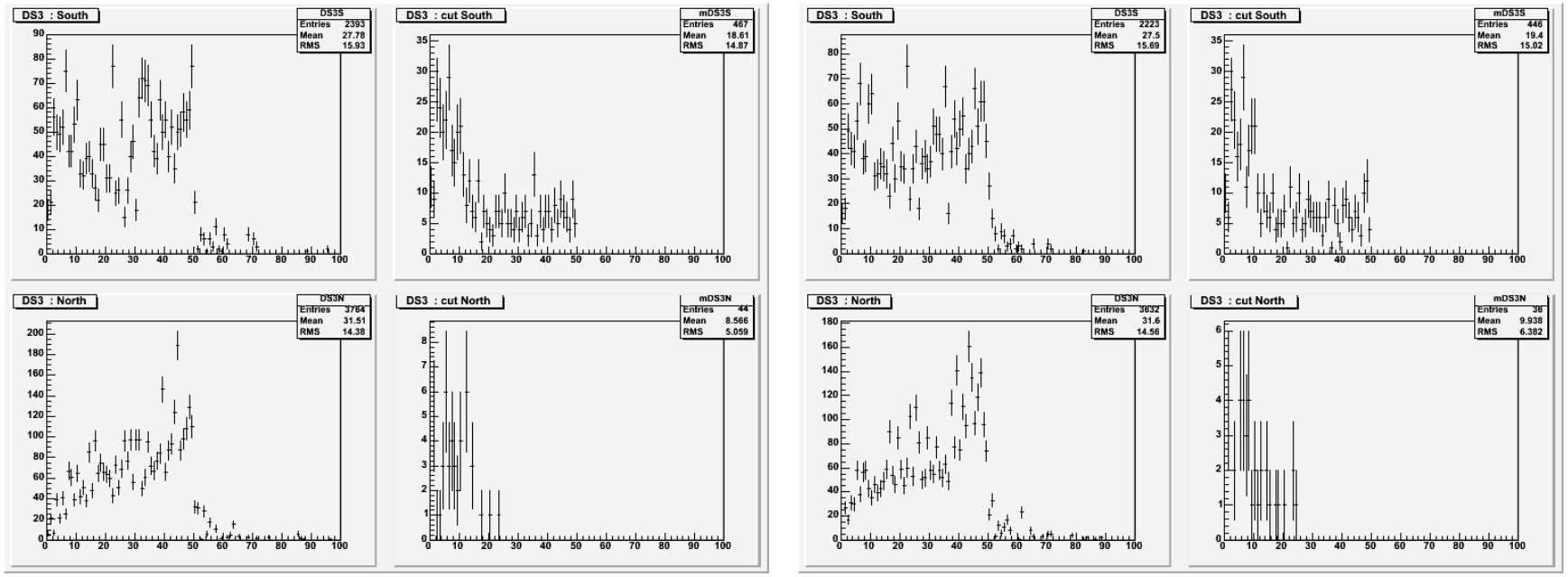
# Track chi2 dist. before & after cut A



# Mutr nhits dist. before & after cut A



# DS3 dist. before & after cut A



# Open angle dist. before & after cut A

(left two: turn off, right two: turn on)
(left 1st : before cut A, left 2nd: after cut A, same as right plots)
(upper: south, lower: north)